

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 382 251 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
21.01.2004 Bulletin 2004/04

(51) Int Cl.7: **A21B 7/00**

(21) Application number: **02258252.2**

(22) Date of filing: **29.11.2002**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
IE IT LI LU MC NL PT SE SK TR**
Designated Extension States:
AL LT LV MK RO SI

- Lee, Jong-wook
Suji-eup, Yongin city, Kyungki-do (KR)
- Sung, Han-jun
Paldal-ku, Suwon-city, Kyungki-do (KR)
- Park, Jae-ryong
Paldal-ku, Suwon-city, Kyungki-do (KR)

(30) Priority: **19.07.2002 KR 2002042591**

(71) Applicant: **Samsung Electronics Co., Ltd.**
Suwon City, Kyungki-do (KR)

(74) Representative: **Brandon, Paul Laurence et al**
APPLEYARD LEES,
15 Clare Road
Halifax HX1 2HY (GB)

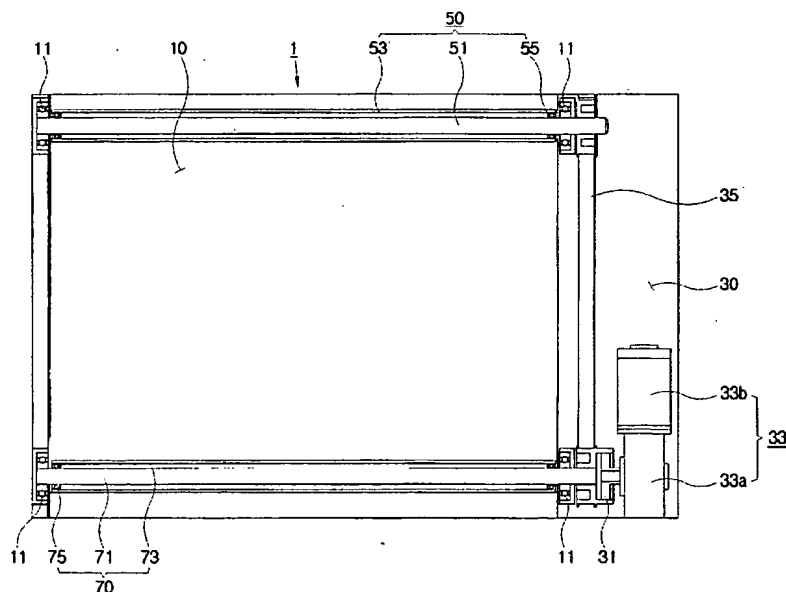
(72) Inventors:
• Lee, Tae-uk
Suwon-city, Kyungki-do (KR)

(54) **Bread maker**

(57) A bread maker including an oven compartment (10), parallel kneading drums inside the oven compartment (10) that alternate between winding and unwinding rotations, and a drum driving part (33) rotating the kneading drums. Each kneading drum includes a rotation shaft (51, 71, 51a) rotating according to the drum

driving part (33); a hollow, cylindrical drum member disposed concentrically along an axis of the rotation shaft; and a clutch between the rotation shaft and the drum member, transmitting a rotary movement from the rotation shaft to the drum member in one direction and allowing the drum member to freewheel in the other direction.

FIG. 4



Description

[0001] The present invention relates to bread makers, and more particularly, though not exclusively, to bread makers with an improved rotation structure between kneading drums.

[0002] Generally, making bread is so complicated that it is difficult for an average person to manually make satisfactory bread at home. That is, making the bread is complicated because multiple steps are involved including mixing raw materials such as flour, sugar, baking powder, etc. to form a dough; kneading the dough; leavening the dough; baking the dough; and so on.

[0003] Therefore, a bread maker has been developed that allows a user to easily make bread. The bread maker automatically performs the foregoing multiple steps and provides finished bread to the user.

[0004] As shown in Figures 1 and 2, a conventional bread maker includes a main body 100 divided into an oven compartment 110 and an electric component compartment 130, a door 300 in the front of the main body 100 to open and close the oven compartment 110, and a control panel (not shown) provided in the front of the electric component compartment 130 to allow a user to the bread maker.

[0005] Inside the oven compartment 110, upper and lower kneading drums 150 and 170 are provided in parallel. The upper and lower kneading drums 150 and 170 have a plurality of projections 157 and 177 that engage a plurality of holes in upper and lower ends of a bag (not shown) filled with raw materials ingredients for preparing the bread. The projections 150 and 170 engage the holes in the bag to wind the bag in clockwise and counterclockwise directions. The upper and lower kneading drums 150 and 170 are rotatably connected to upper and lower opposite inner-walls of the main body 100 using respective bearings 111.

[0006] Between the upper and lower kneading drums 150 and 170 is provided a baking tray 113 in which the dough is contained for baking. On the inside walls of the main body 100 and the door 300 are respective heaters 115 for heating the baking tray 113.

[0007] Beside the oven compartment 110 is the electric component compartment 130. Inside the electric component compartment 130 are a drum driving part 133, including a motor 133b incorporated with a gear reducer 133a to rotate the lower kneading drum 170 in clockwise and counterclockwise directions, and a belt 135 connecting the upper and lower kneading drums 150 and 170 to transmit a rotary movement from the lower kneading drum 170 to the upper kneading drum 150. The drum driving part 133 and the lower kneading drum 170 are connected by a coupler 131.

[0008] With the conventional configuration, the process of setting up the bag on the upper and lower kneading drums 150 and 170 is performed as follows.

[0009] First, the holes provided in the upper end of the bag engage with the projections 157 of the upper knead-

ing drum 150, and then the bag is wound on the upper kneading drum 150 by rotating the drum driving part 133. At this time, the bag is wound only enough to place the lower end of the bag at the projections 177 of the lower kneading drum 170. Then, the holes provided in the lower end of the bag engage with the projections 177 of the lower kneading drum 170, thereby completing the setting up process.

[0010] However, in the conventional bread maker, because the upper and lower kneading drums 150 and 170 are mechanically bound with the drum driving part 133, the projections 157 of the upper kneading drum 150 are rotated depending upon the rotary movement of the projections 177 of the lower kneading drum 170. Hence, if the holes provided in the lower end of the bag deviate from the projections 177 of the lower kneading drum 170 because, for example, the bag is not wound sufficiently to place the lower end of the bag at the projections 177 of the lower kneading drum 170, the user must restart the setting up process.

[0011] Further, in the conventional bread maker, the drum driving part 133 must be operated to remove the bag from the bread maker, which increases electric power consumption.

[0012] It is an aim of preferred embodiments of the present invention to provide a bread maker in which a mixing bag may be easily installed and removed.

[0013] Additional advantages of preferred embodiments of the invention will be set forth in part in the description that followed, and, in part, will be obvious from the description, or may be learned by practice of the invention.

[0014] According to an aspect of the present invention, there is provided a bread maker including an oven compartment, parallel kneading drums inside the oven compartment that alternate between winding and unwinding rotations; and a drum driving part rotating the kneading drums; each kneading drum includes a rotation shaft rotating according to the drum driving part; a drum member disposed concentrically along an axis of the rotation shaft; and a clutch between the rotation shaft and the drum member, transmitting a rotary movement from the rotation shaft to the drum member in one direction and allowing the drum member to freewheel in the other direction.

[0015] Suitably, the drum member is a cylinder in which the rotation shaft is accommodated.

[0016] According to another aspect of the present invention, there is provided a bread maker including an oven compartment, parallel kneading drums inside the oven compartment that alternate between winding and unwinding rotations, and a drum driving part rotating the kneading drums; each kneading drum includes a solid cylindrical drum member; a rotation shaft accommodated by the drum member and rotated by the drum driving part; and a clutch connecting the rotation shaft and the drum member, the clutch transmitting a rotary movement from the rotation shaft to the drum member in one

direction and allowing the drum member to freewheel in the other direction.

[0017] According to another aspect of the present invention, there is provided a kneading drum apparatus for a bread maker, including an upper kneading drum and a lower kneading drum; a rotation shaft in the upper kneading drum and the lower kneading drum; a hollow, cylindrical drum member disposed concentrically around each rotation shaft; a drum driving part rotating one of the upper kneading drum and the lower kneading drum; a belt connecting the rotation shafts of the upper kneading drum and the lower kneading drum and transmitting a rotary movement from the kneading drum rotated by the drum driving part to the other kneading drum; and a clutch connecting the rotation shaft to the drum member in the upper kneading drum and the lower kneading drum; the clutch transmits the rotary movement from the rotation shaft to the drum member in one direction and allows the drum member to freewheel in the other direction.

[0018] Further features of the present invention are set out in the appended claims.

[0019] These together with other aspects and advantages which will be subsequently apparent, reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part thereof, wherein like numerals refer to like parts throughout.

[0020] The present invention will become apparent and more readily appreciated from the following description of the embodiments thereof, by way of example only, taken in conjunction with the accompany drawings, of which:

Figure 1 is a perspective view of a conventional bread maker;

Figure 2 is a front sectional view schematically illustrating the conventional bread maker of Figure 1;

Figure 3 is a perspective view of a bread maker according to a first embodiment of the present invention;

Figure 4 is a front sectional view schematically illustrating the bread maker of Figure 3;

Figure 5 is an enlarged sectional view partially illustrating the bread maker of Figure 4; and

Figure 6 is an enlarged sectional view partially illustrating a bread maker according to a second embodiment of the present invention.

[0021] Hereinafter, embodiments of the present invention will be described in detail with reference to the attached drawings, wherein the like reference numerals refer to the like elements throughout. The present inven-

tion may, however, be embodied in many different forms and should not be construed as being limited to the embodiments set forth herein; rather, these embodiments are provided so that the present disclosure will be thorough and complete, and will fully convey the concept of the invention to those skilled in the art.

[0022] As shown in Figure 3, a bread maker according to a first embodiment of the present invention includes a main body 1 divided into an oven compartment 10 and an electric component compartment 30, a door 3 in the front of the main body 1 to open and close the oven compartment 10, and a control panel (not shown) in the front of the electric component compartment 30 to allow a user to control the bread maker.

[0023] Inside the oven compartment 10, upper and lower kneading drums 50 and 70 are provided in parallel and engage a bag (not shown) filled with raw materials for preparing the bread by winding the bag in clockwise and counterclockwise directions. The upper and lower kneading drums 50 and 70 are rotatably connected to upper and lower opposite inner-walls of the main body 1 using respective bearings 11 (Figure 4). The upper and lower kneading drums 50 and 70 are rotated by a drum driving part 33 (described below), which winds the bag on and off the upper and lower kneading drums 50 and 70, thereby kneading the dough in the bag.

[0024] Between the upper and lower kneading drums 50 and 70 is a baking tray 13 in which the dough is contained for baking. On the inside walls of the main body 1 and the door 3 are respective heaters 15 for heating the baking tray 13.

[0025] Beside the oven compartment 10 is the electric component compartment 30. Inside the electric component compartment 30 is the drum driving part 33, including a motor 33b incorporated with a gear reducer 33a to rotate the lower kneading drum 70 in clockwise and counterclockwise directions. The drum driving part 33 is connected to one side of the lower kneading drum 70 by a coupler 31.

[0026] Referring to Figures 4 and 5, the upper and lower kneading drums 50 and 70 both include respective rotation shafts 51 and 71 that are rotated by the drum driving part 33, respective drum members 53 and 73 that lay concentrically along the axis of the respective rotation shafts 51 and 71, and respective clutches 55 and 75 that are placed between the rotation shafts 51 and 71 and the drum members 53 and 73. The clutches 55 and 75, connect the rotation shafts 51 and 71 with the drum members 53 and 73 when the bag is wound on the upper and lower kneading drums 50 and 70, and disconnect the rotation shafts 51 and 71 from the drum members 53 and 73 when the bag is wound off the upper and lower kneading drums 50 and 70.

[0027] The rotation shaft 71 of the lower kneading drum 70 is connected to the drum driving part 33 of the electric component compartment 30 by the coupler 31 and is rotated by the drum driving part 33, alternating between a winding direction and an unwinding direction.

Further, the rotation shaft 71 of the lower kneading drum 70 is connected to the rotation shaft 51 of the upper kneading drum 50 by a belt 35, so that a rotational force (or rotary movement) is transmitted from the lower rotation shaft 71 to the upper rotation shaft 51.

[0028] The upper and lower drum members 53 and 73 are hollow cylinders and respectively accommodate the upper and lower rotation shafts 51 and 71, forming an outer portion of the upper and lower kneading drums 50 and 70. The upper and lower drum members 53 and 73 have a plurality of respective projections 57 and 77 at regular intervals, and the plurality of projections 57 and 77 engage the holes of the upper and lower ends of the bag.

[0029] The clutches 55 and 75 are placed between the rotation shafts 51 and 71 and the drum members 53 and 73, and allow the drum members 53 and 73 to freewheel relative to the rotation shafts 51 and 71 in one direction only. Hence, the clutches 55 and 75 allow the drum members 53 and 73 to freewheel relative to the rotation shafts 51 and 71 when the bag is wound on the drum members 53 and 73, but prevent the drum members 53 and 73 from freewheeling relative to the rotation shafts 51 and 71 when the bag is wound off the drum members 53 and 73.

[0030] In the bread maker according to preferred embodiments of the present invention, the processes of setting up, kneading, and removing the bag are performed as follows.

[0031] First, the holes in the upper end of the bag filled with raw materials for the bread engage the projections 57 in the drum member 53 of the upper kneading drum 50. Thereafter, the upper kneading drum 50 rotates so that the bag is wound on the upper kneading drum 50. The drum member 53 of the upper kneading drum 50 may be manually rotated relative to the rotation shaft 51 without operating the drum driving part 33, thereby decreasing electric power consumption.

[0032] When the bag is wound enough to place the lower end of the bag at the projections 77 of the lower kneading drum 70, the holes provided in the lower end of the bag engage the projections 77 provided in the drum member 73 of the lower kneading drum 70. At this time, even if the holes provided in the lower end of the bag deviate from the projections 77 of the lower kneading drum 70, the holes of the bag may engage the projections 77 of the lower kneading drum 70 by properly rotating the drum member 73 in the winding direction.

[0033] After the bag is completely set up, the drum driving part 33 rotates the upper and lower rotation shafts 51 and 71. At this time, when the lower rotation shaft 71 is rotated in the winding direction, the upper rotation shaft 51 is rotated in the unwinding direction, and vice versa.

[0034] That is, when the lower rotation shaft 71 rotates in the winding direction, the lower drum member 73 rotates with the lower rotation shaft 71, with the lower end of the bag being wound thereon. Simultaneously,

when the upper rotation shaft 51 rotates in the unwinding direction by cooperating with the lower rotation shaft 71, the upper drum member 53 rotates in the unwinding direction independently of the upper rotation shaft 51 because the lower drum member 73 pulls the bag down while rotating. On the other hand, when the upper rotation shaft 51 rotates in the winding direction, the upper and lower drum members 53 and 73 operate in reverse directions.

[0035] According to a second embodiment of the present invention, as shown in Figure 6, the upper drum member 53a of the upper kneading drum 50a, as well as the lower drum member of the lower kneading drum (not shown), is a solid cylinder, in contrast to the drum members 53 and 73 according to the first embodiment of the present invention, in which the drum members 53 and 73 are hollow cylinders through which the long rotation shafts 51 and 71 pass, respectively. Thus, according to the second embodiment, short rotation shafts 51a are provided on opposite inner walls of the upper and lower parts of the oven compartment 10, respectively. Further, the drum member 53a and the rotation shaft 51a are connected by a clutch 55a placed between the drum member 53a and the rotation shaft 51a.

[0036] In the foregoing embodiments, the clutches 55, 75, and 55a are provided at opposite ends of the upper and lower kneading drums 50, 70, and 50a. However, the clutches 55, 75, and 55a may be provided at one end of the upper and lower kneading drums 50, 70, and 50a, to which a rotary movement of the drum driving part 33 is first transmitted. As described above, the upper and lower kneading drums 50, 70, and 50a include the upper and lower rotation shafts 51, 71, and 51a that rotate according to the drum driving part 33, and the upper and lower drum members 53, 73, and 53a freewheel relative to the upper and lower rotation shafts 51, 71, and 51a in one direction only, so that the bag can be easily set up and removed from the upper and lower kneading drums 50, 70, and 50a.

[0037] Further, the bag may be manually set up and removed from the upper and lower kneading drums 50, 70, and 50a, thereby decreasing electric power consumption.

[0038] As described above, preferred embodiments of the present invention provide a bread maker in which upper and lower drum members 50, 70, and 50a may freewheel, so that a bag can be easily set up and removed.

[0039] Further, preferred embodiments of the present invention provides a bread maker in which a bag may be manually set up and removed, thereby decreasing electric power consumption.

[0040] Although a few embodiments of the present invention have been shown and described, it will be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the principles and spirit of the invention, the scope of which is defined in the appended claims and their equiv-

alents.

[0041] The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

[0042] All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

[0043] Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

[0044] The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

Claims

1. A bread maker comprising an oven compartment (10), parallel kneading drums (50, 70, 50a) inside the oven compartment (10) that alternate between winding and unwinding rotations, and a drum driving part (33) rotating the kneading drums (50, 70, 50a), each kneading drum comprising:

a rotation shaft (51, 71, 51a) rotating according to the drum driving part (33);

a drum member (53, 73, 53a) disposed concentrically along an axis of the rotation shaft (51, 71, 51a); and

a clutch (55, 75, 55a) between the rotation shaft (51, 71, 51a) and the drum member (53, 73, 53a), transmitting a rotary movement from the rotation shaft (51, 71, 51a) to the drum member (53, 73, 53a) in one direction and allowing the drum member (53, 73, 53a) to freewheel in the other direction.

2. The bread maker according to claim 1, wherein the drum member (53, 73) is a cylinder in which the rotation shaft (51, 71) is accommodated.
3. The bread maker according to claim 1 or claim 2,

wherein the kneading drums (50, 70, 50a) are rotatably connected to upper and lower opposite inner-walls of a main body (1) using respective bearings.

4. The bread maker according to any preceding claim, further comprising a belt connecting the rotation shafts (51, 71, 51a) of the kneading drums (50, 70, 50a) to transmit a rotary movement between the kneading drums (50, 70, 50a).
5. The bread maker of claim 1, wherein the drum members (53, 73) are hollow cylinders and the rotation shafts (51, 71) are longer than the drum members (53, 73) and pass through the respective hollow drum members (53, 73), the drum members (53, 73) forming an outer portion of the respective kneading drums (50, 70).
6. The bread maker according to any preceding claim, wherein the clutches (55, 75, 55a) are located at opposite ends of the kneading drums (50, 70, 50a).
7. The bread maker according to claim 1, wherein the clutches are located at an end of the kneading drums to which the rotary movement is applied.
8. The bread maker according to any preceding claim, wherein the drum members (53, 73, 53a) have a plurality of projections (57, 77) and a bag filled with bread dough is attached to the projections (57, 77) and wound on and off the kneading drums (50, 70, 50a) using the driving part (33), thereby kneading the dough in the bag.
9. The bread maker according to claim 8, wherein, for each kneading drum (50, 70, 50a), the clutch (55, 75, 55a) connects the rotation shaft (51, 71, 51a) with the drum member (53, 73, 53a) when the bag is wound on the kneading drum (50, 70, 50a), and disconnects the rotation shaft (51, 71, 51a) from the drum member (53, 73, 53a) when the bag is wound off the kneading drum (50, 70, 50a).
10. The bread maker according to claim 8 or claim 9, wherein, for each kneading drum (50, 70, 50a), the clutch (55, 75, 55a) allows the drum member (53, 73, 53a) to freewheel relative to the rotation shaft (51, 71, 51a) when the bag is wound on the drum member (53, 73, 53a), but prevents the drum member (53, 73, 53a) from freewheeling relative to the rotation shaft (51, 71, 51a) when the bag is wound off the drum member (53, 73, 53a).
11. The bread maker according to any one of claims 8-10, wherein the kneading drums (50, 70, 50a) include an upper kneading drum (50, 50a) and a lower kneading drum (70) and holes in an upper end of

the bag engage the projections (57) in the drum member (53, 53a) of the upper kneading drum (50, 50a), and the upper kneading drum (50, 50a) is rotated sufficiently to wind the bag on the upper kneading drum (50, 50a) and position holes in a lower end of the bag at the projections (57) of the drum member (73) of the lower kneading drum (70).

12. The bread maker according to claim 11, wherein the drum driving part (33) alternately rotates the rotation shafts (51, 71, 51a), with the rotation shaft (71) of the lower kneading drum (73) rotating in a winding direction and the rotation shaft (51, 51a) of the upper kneading drum (53, 53a) rotating in an unwinding direction, and vice versa.

13. The bread maker according to claim 11 or claim 12, wherein when the rotation shaft (71) of the lower kneading drum (70) rotates in a winding direction, the respective drum member (73) rotates with the rotation shaft (71) of the lower kneading drum to wind the lower end of the bag on the lower kneading drum (70), while, simultaneously, the rotation shaft (51, 51a) of the upper kneading drum (50, 50a) rotates in an unwinding direction and the respective drum member (53, 53a) rotates independently of the rotation shaft of the upper kneading drum (50, 50a) as the drum member (73) of the lower kneading drum (70) pulls down the bag, and vice versa.

14. The bread maker according to any one of claims 11-13, wherein the drum members (53, 73, 53a) of the kneading drums (50, 70, 50a) are manually rotated relative to the respective rotation shafts (51, 71, 51a) without operating the drum driving part (33) to decrease electric power consumption.

15. A bread maker comprising an oven compartment (10), parallel kneading drums (50a, 70) inside the oven compartment (10) that alternate between winding and unwinding rotations, and a drum driving part (33) rotating the kneading drums (50a, 70), each kneading drum comprising:

a solid cylindrical drum member (53a);

a rotation shaft (51a) accommodated by the drum member (53a) and rotated by the drum driving part (33); and

a clutch (55a) connecting the rotation shaft (51a) and the drum member (53a), transmitting a rotary movement from the rotation shaft (51a) to the drum member (53a) in one direction and allowing the drum member (53a) to freewheel in the other direction.

16. The bread maker according to claim 15, wherein the

kneading drums (50a, 70) are rotatably connected to upper and lower opposite inner-walls of a main body using respective bearings.

17. The bread maker according to claim 15 or claim 16, further comprising a belt connecting the rotation shafts (51a, 71) of the kneading drums to transmit a rotary movement between the kneading drums (50a, 70).

18. The bread maker of any one of claims 15-17, wherein the drum members (53a, 73) are longer than the rotation shafts (51a, 71) and the rotation shafts (51a, 71) are incorporated into the drum members (53a, 73) at ends of the drum members (53a, 73) and connected to opposite inner walls of upper and lower parts of the oven compartment (10).

19. The bread maker according to any one of claims 15-18, wherein:

the drum members (53a, 73) have a plurality of projections (57, 77) and a bag filled with bread dough is attached to the projections (57, 77) and wound on and off the kneading drums (50a, 70) using the driving part (33), thereby kneading the dough in the bag; and

for each kneading drum (50a, 70), the clutch (55a, 75) connects the rotation shaft (51a, 71) with the drum member (53a, 73) when the bag is wound on the kneading drum (50a, 70), and disconnects the rotation shaft (51a, 71) from the drum member when the bag is wound off the kneading drum (50a, 70).

20. The bread maker according to any one of claims 15-18, wherein:

the drum members (53a, 73) have a plurality of projections (57, 77) and a bag filled with bread dough is attached to the projections (57, 77) and wound on and off the kneading drums (50a, 70) using the driving part (33), thereby kneading the dough in the bag; and

for each kneading drum (50a, 70), the clutch (55, 75) allows the drum member (53a, 73) to freewheel relative to the rotation shaft (51a, 71) when the bag is wound on the drum member (53a, 73), but prevents the drum member (53a, 73) from freewheeling relative to the rotation shaft (51a, 71) when the bag is wound off the drum member (53a, 73).

21. The bread maker according to any one of claims 15-18, wherein:

the drum members (53a, 73) have a plurality of projections (57, 77) and a bag filled with bread dough is attached to the projections (57, 77) and wound on and off the kneading drums (50a, 70) using the driving part (33), thereby kneading the dough in the bag;

the kneading drums (50a, 70) include an upper kneading drum (50a) and a lower kneading drum (70) and holes in an upper end of the bag engage the projections (57) in the drum member of the upper kneading drum (50a), and the upper kneading drum (50a) is rotated sufficiently to wind the bag on the upper kneading drum (50a) and position holes in a lower end of the bag at the projections (57) of the drum member (73) of the lower kneading drum (70); and

the drum driving part (33) alternately rotates the rotation shafts (51a, 71), with the rotation shaft (71) of the lower kneading drum (70) rotating in a winding direction and the rotation shaft (51a) of the upper kneading drum (50a) rotating in an unwinding direction, and vice versa.

22. The bread maker according to any one of claims 15-18, wherein:

the drum members (53, 73a) have a plurality of projections (57, 77) and a bag filled with bread dough is attached to the projections (57, 77) and wound on and off the kneading drums (50a, 70) using the driving part (33), thereby kneading the dough in the bag;

the kneading drums (50a, 70) include an upper kneading drum (50a) and a lower kneading drum (70) and holes in an upper end of the bag engage the projections (57, 77) in the drum member (53a) of the upper kneading drum (50a), and the upper kneading drum (50a) is rotated sufficiently to wind the bag on the upper kneading drum (50a) and position holes in a lower end of the bag at the projections (77) of the drum member (73) of the lower kneading drum (70); and

the drum members (53a, 73) of the kneading drums (50a, 70) are manually rotated relative to the respective rotation shafts (51a, 71) without operating the drum driving part (33) to decrease electric power consumption.

23. A kneading drum apparatus for a bread maker, comprising:

an upper kneading drum (50, 50a) and a lower kneading drum (70);

a rotation shaft (51, 71, 51a) in the upper kneading drum (50, 50a) and the lower kneading drum (70);

a drum member (53, 73, 53a) disposed concentrically around each rotation shaft (51, 71, 51a);

a drum driving part (33) rotating one of the upper kneading drum (50, 50a) and the lower kneading drum (70);

a belt (35) connecting the rotation shafts (51, 71, 51a) of the upper kneading drum (50, 50a) and the lower kneading drum (70) and transmitting a rotary movement from the kneading drum rotated by the drum driving part (33) to the other kneading drum; and

a clutch (55, 75, 55a) connecting the rotation shaft (51, 71, 51a) to the drum member (53, 73, 53a) in the upper kneading drum (50, 50a) and the lower kneading drum (70), the clutch (55, 75, 55a) transmitting the rotary movement from the rotation shaft (51, 71, 51a) to the drum member (53, 73, 53a) in one direction and allowing the drum member (53, 73, 53a) to free-wheel in the other direction.

24. The apparatus according to claim 23, wherein the upper kneading drum (50, 50a) and the lower kneading drum (70) are rotatably connected to upper and lower opposite inner-walls of a main body of the bread maker using respective bearings.

25. The apparatus according to claim 23, wherein each drum member (53, 73, 53a) is a hollow cylinder accommodating a respective rotation shaft and forming an outer portion of the upper kneading drum (50) and the lower kneading drum (70).

26. The apparatus of claim 23, wherein the rotation shafts (51, 71, 51a) are longer than the drum members (53, 73, 53a) and the rotation shafts pass through the hollow drum members (53, 73, 53a).

27. The apparatus according to any one of claims 23-26, wherein:

the drum members (53, 73, 53a) have a plurality of projections (57, 77) and a bag filled with ingredients for bread is attached to the projections (57, 77) and wound on and off the upper kneading drum (53, 53a) and the lower kneading drum (73); and

the clutch (55, 75, 55a) connects the rotation shaft (51, 71, 51a) with the drum member (53, 73, 53a) when the bag is wound on the corre-

sponding upper kneading drum (50, 50a) or the lower kneading drum (70), and disconnects the rotation shaft (51, 71, 51a) from the drum member (53, 73, 53a) when the bag is wound off the corresponding upper kneading drum (50, 50a) or the lower kneading drum (70). 5

28. The apparatus according to claim 23, wherein:

the drum members (53, 73, 53a) have a plurality of projections (57, 77) and a bag filled with ingredients for bread is attached to the projections (57, 77) and wound on and off the upper kneading drum (50, 50a) and the lower kneading drum (70); and 10 15

the clutches (55, 75, 55a) allow the respective drum members (53, 73, 53a) to freewheel relative to the respective rotation shafts (51, 71, 51a) when the bag is wound on the drum members (53, 73, 53a), but prevents the respective drum members (53, 73, 53a) from freewheeling relative to the rotation shafts (51, 71, 51a) when the bag is wound off the respective drum members (53, 73, 53a). 20 25

29. The apparatus according to claim 23, wherein:

the drum members (53, 73, 53a) have a plurality of projections (57, 77) and a bag filled with ingredients for bread is attached to the projections (57, 77) and wound on and off the upper kneading drum (50, 50a) and the lower kneading drum (70); 30 35

holes in an upper end of the bag engage the projections (57, 77) in the drum member (53, 53a) of the upper kneading drum (50, 50a), and the upper kneading drum (53, 53a) is sufficiently rotated to wind the bag on the upper kneading drum (53, 53a) and position holes in a lower end of the bag at the projections (57, 77) of the drum member (73) of the lower kneading drum (70); and 40 45

the drum driving part (33) alternately rotates the rotation shafts (51, 71, 51a), with the rotation shaft (71) of the lower kneading drum (73) rotating in a winding direction and the rotation shaft (51, 51a) of the upper kneading drum (53, 53a) rotating in an unwinding direction, and vice versa. 50

30. The apparatus according to claim 23, wherein:

the drum members (53, 73, 53a) have a plurality of projections (57, 77) and a bag filled with ingredients for bread is attached to the projec- 55

tions (57, 77) and wound on and off the upper kneading drum (50, 50a) and the lower kneading drum (70);

holes in an upper end of the bag engage the projections (57, 77) in the drum member (53, 53a) of the upper kneading drum (50, 50a), and the upper kneading drum (50, 50a) is sufficiently rotated to wind the bag on the upper kneading drum (53, 53a) and position holes in a lower end of the bag at the projections of the drum member (73) of the lower kneading drum (70); and

the drum members (53, 73, 53a) of the kneading drums (50, 70, 50a) may be manually rotated relative to the respective rotation shafts (51, 71, 51a) without operating the drum driving part (33) to decrease electric power consumption.

FIG. 1
(PRIOR ART)

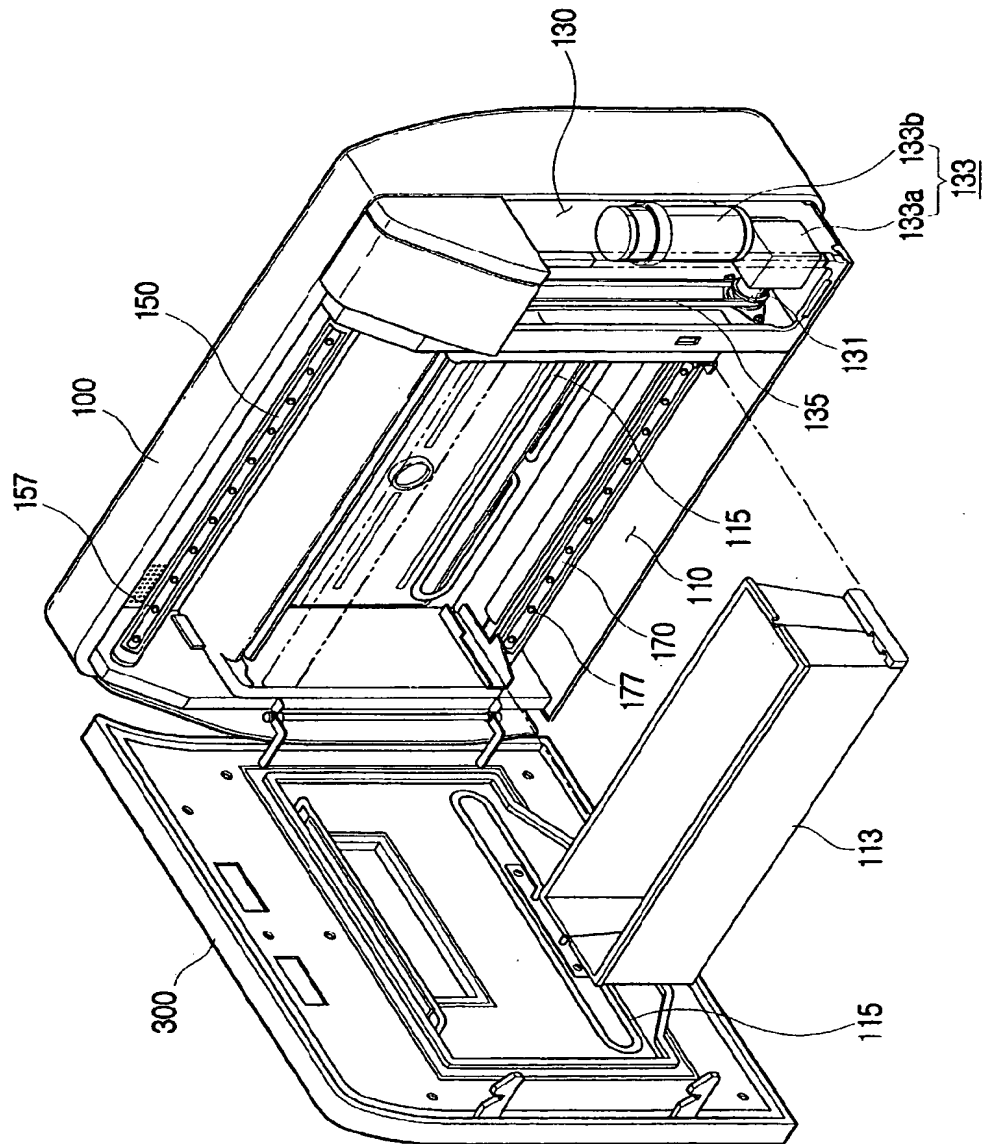


FIG. 3

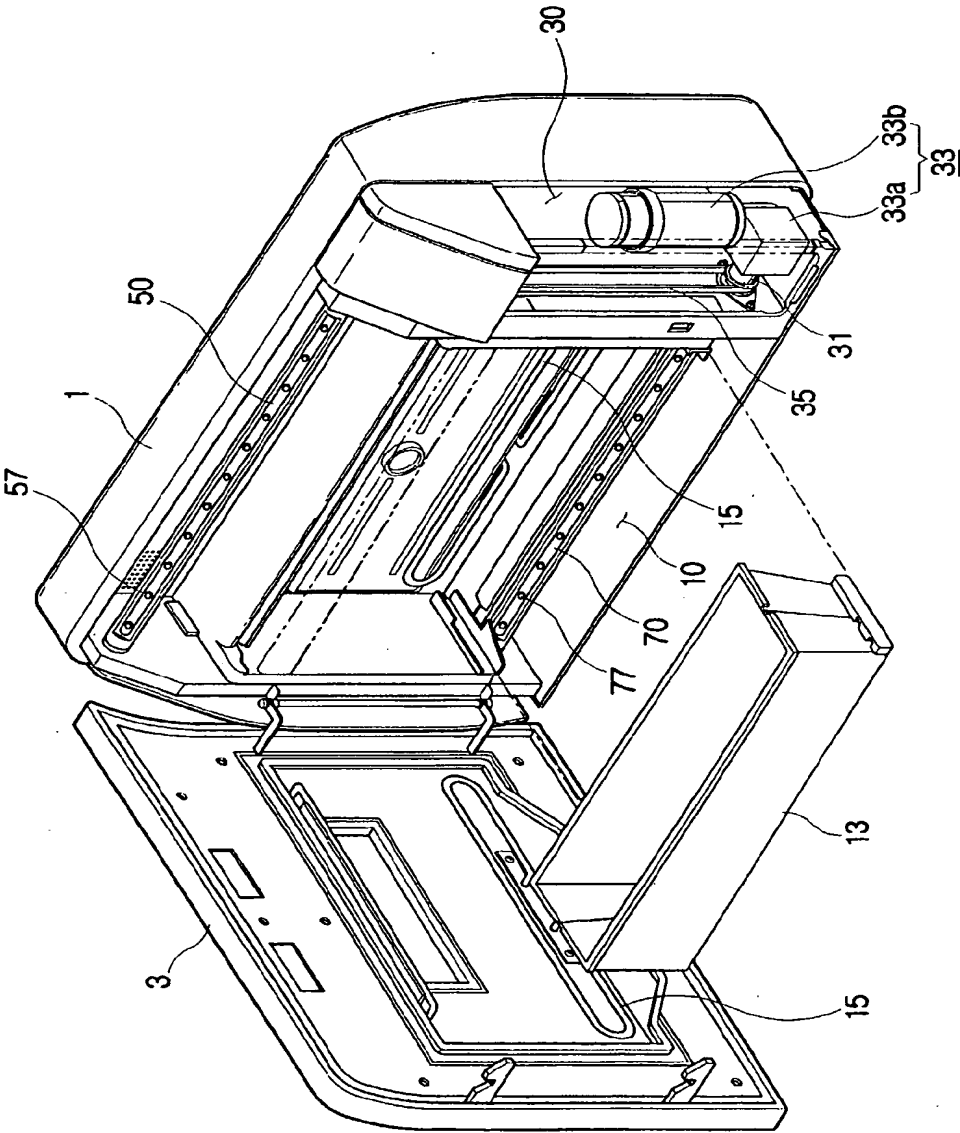


FIG. 4

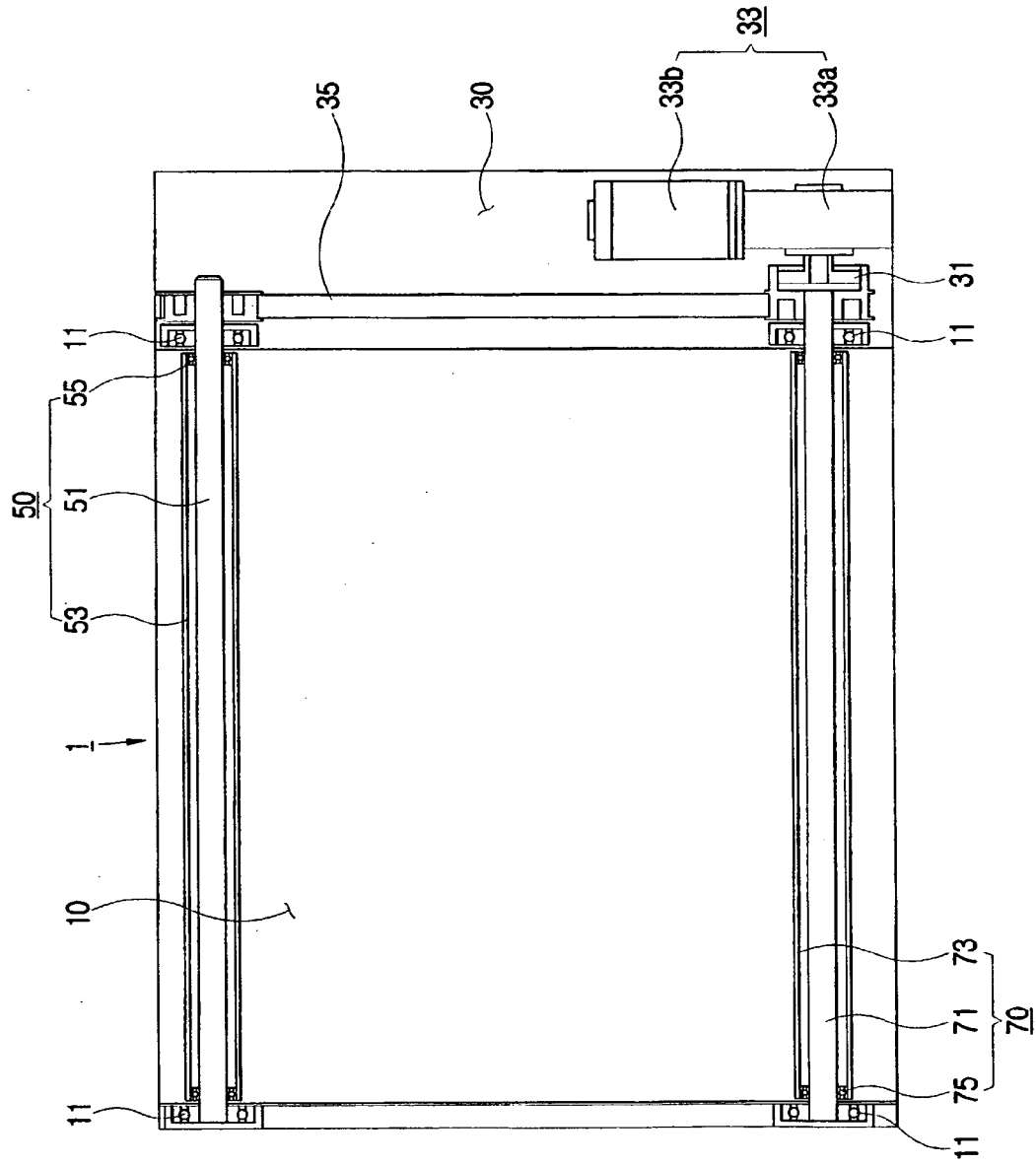


FIG. 5

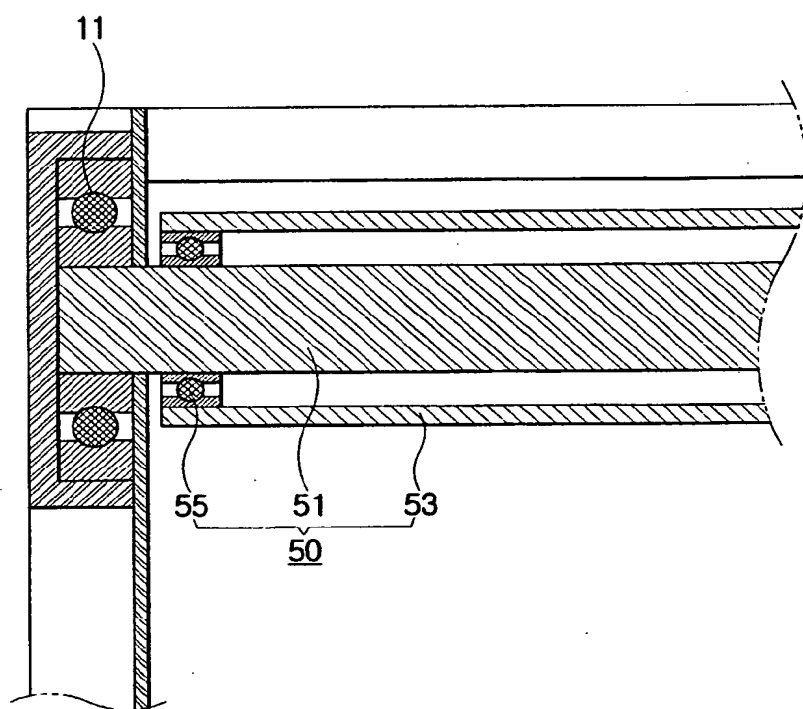
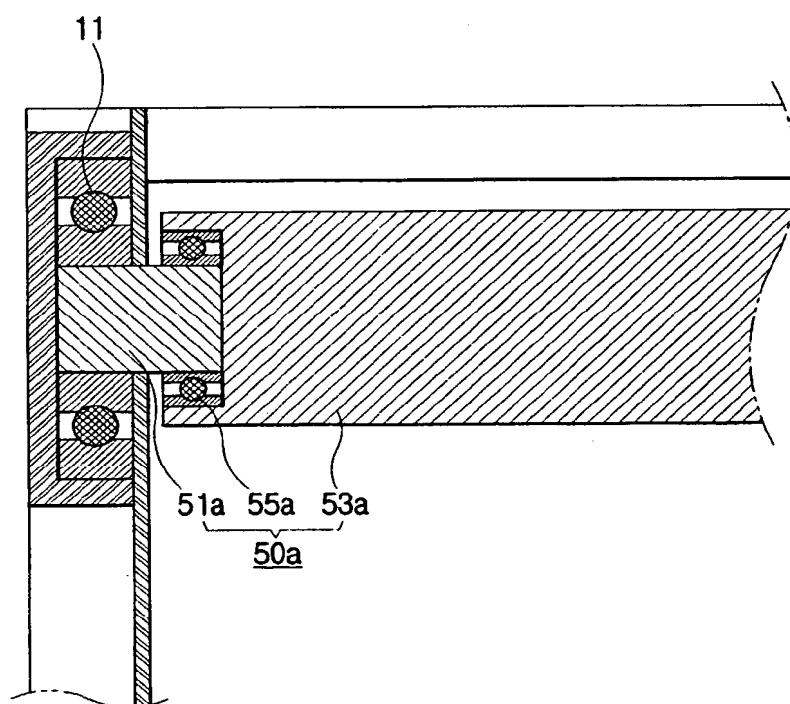


FIG. 6





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 25 8252

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	US 4 803 086 A (HEDENBERG GUNNAR) 7 February 1989 (1989-02-07) * the whole document *	1-5,8, 11,12, 23-26,29	A21B7/00
Y	US 2 691 435 A (PAUL KLAMP) 12 October 1954 (1954-10-12) * the whole document *	1-5,8, 11,12, 23-26,29	
A	US 2 576 337 A (FARKAS EUGENE J) 27 November 1951 (1951-11-27) * the whole document *	1,2,23, 25	
A	US 3 687 251 A (HOERNER ALFRED J) 29 August 1972 (1972-08-29) * the whole document *	1,2,23, 25	
A	US 4 550 654 A (HEDENBERG GUNNAR) 5 November 1985 (1985-11-05)		
A	US 5 947 009 A (HEDENBERG ROLF P) 7 September 1999 (1999-09-07)		<p>TECHNICAL FIELDS SEARCHED (Int.Cl.7)</p> <p>A21B F16D</p>
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 28 October 2003	Examiner Silvis, H
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/02 (P04001)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 25 8252

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-10-2003

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4803086	A	07-02-1989	WO 8603931 A1	17-07-1986
			AT 393771 B	10-12-1991
			AT 903086 A	15-06-1991
			AT 47002 T	15-10-1989
			BE 906013 A1	16-04-1987
			BR 8507305 A	03-11-1987
			BR 8607054 A	23-02-1988
			CA 1268665 A1	08-05-1990
			CH 671321 A5	31-08-1989
			DE 3573512 D1	16-11-1989
			DE 3690660 C2	27-05-1993
			DE 3690660 T	10-03-1988
			DK 393186 A	19-08-1986
			DK 409587 A	06-08-1987
			WO 8703784 A1	02-07-1987
			ES 2003997 A6	01-12-1988
			FI 872791 A ,B,	23-06-1987
			FI 873605 A ,B,	20-08-1987
			FR 2591865 A1	26-06-1987
			GB 2191928 A ,B	31-12-1987
			JP 6055102 B	27-07-1994
			JP 1500320 T	09-02-1989
			KR 9110203 B1	21-12-1991
			NL 8620514 T	23-12-1985
			NO 863316 A ,B,	18-08-1986
			NO 873503 A ,B,	19-08-1987
			SE 465994 B	02-12-1991
			SE 8703161 A	14-08-1987
US 2691435	A	12-10-1954	NONE	
US 2576337	A	27-11-1951	NONE	
US 3687251	A	29-08-1972	NONE	
US 4550654	A	05-11-1985	US 4590850 A	27-05-1986
US 5947009	A	07-09-1999	AT 235312 T	15-04-2003
			AU 737768 B2	30-08-2001
			AU 1414599 A	07-06-1999
			BR 9814876 A	03-10-2000
			CA 2310844 A1	27-05-1999
			DE 69812691 D1	30-04-2003
			EA 1996 B1	22-10-2001
			EP 1032468 A1	06-09-2000
			HU 0100951 A2	28-12-2001

EPO FORM P449

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

THIS PAGE BLANK (USPTO)

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☒ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☒ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.

THIS PAGE BLANK (USPTO)